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Factsheet

FLYSPECK AND SOOTY BLOTCH OF APPLE

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Two summer diseases which may appear on apple fruit at harvest are flyspeck and sooty blotch. These diseases occur throughout the eastern apple growing areas of North America, but are most severe in the central and southern regions. Flyspeck and sooty blotch are not commonly seen on commercially grown fruit in Ontario, but may become more prevalent if fungicide use patterns change.

The symptoms of both diseases frequently appear together. Sooty blotch is caused by the fungus *Gloeodes pomigena*. Contrary to its name, flyspeck is not caused by insects but by the fungus *Schizothyrium pomi*. These fungi grow only on the surface of the fruit, and therefore, do not damage the flesh. The blotches on the skin can be so extensive, however, that the market value of the fruit can be downgraded from fresh market to processing or juice quality. In storage, fruit with severe infections of sooty blotch may shrivel more readily than uninfected fruit.

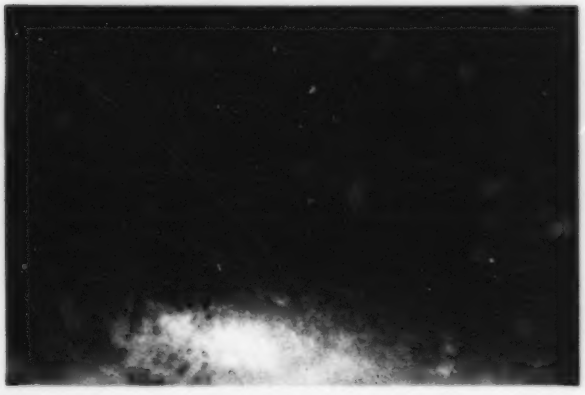

Figure 1. Flyspeck: Fruiting Structures

SYMPTOMS

Typically, in commercial orchards in Ontario, flyspeck is seen on the fruit more often than sooty blotch. Flyspeck appears as groups of a few to many small, sharply defined, shiny black dots (approximately 0.5mm in size) on the apple skin (Figure 1). These colonies of dots can vary in size but are usually in round or irregular groups 1-3 cm in diameter (Figure 2). Each black dot is a fruiting structure of the fungus. Insect frass, particularly from the white apple leafhopper, can be mistaken for flyspeck. Frass tends to be less well-defined than flyspeck, and rubs off more easily, particularly if wetted.

Figure 2. Colonies of the Flyspeck Fungus

Figure 3. Sooty Blotch

Sooty blotch appears as brown to olive green, cloudy blotches, with irregular margins on the surface of the apple skin. These are variable in size, and can coalesce to cover large areas of the fruit (Figure 3). The blotches can be removed by vigorous rubbing. Sooty blotch should not be confused with

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sooty mould. Sooty mould is caused by the visible growth of saprophytic species of fungi, which grow on the sticky, sugary honeydew which has been excreted by aphids or other sucking insects. Sooty mould will also grow on the leaves and twigs, or wherever honeydew has fallen; sooty blotch, however, appears only on the fruit. Sooty mould can be removed much more easily from the surface of the apple than can sooty blotch.

BIOLOGY

The fungi causing sooty blotch and flyspeck can overwinter on dead twigs of numerous woody plant species, including apple trees. Both diseases are favoured by moderate temperatures, high humidity, and abundant rainfall.

Flyspeck

Primary infections of flyspeck are initiated by airborne spores, discharged during rainy periods by the overwintering stage of the fungus from just before bloom to 1-2 months after bloom. The optimum temperature for the germination of the primary spores is 20°C, although they will germinate in temperatures from 16-28°C. High humidity is important for the development of flyspeck.

Under optimal conditions, colonies become visible in 10-12 days after infection. In the orchard, at least 3 weeks of incubation are usually needed before symptoms become apparent. Secondary spread of flyspeck is by airborne spores, which are produced abundantly on the fruit. The optimum conditions for secondary spore production is a temperature of approximately 17°C and relative humidity greater than 96%.

Sooty Blotch

Spores of the sooty blotch fungus are dispersed from infected twigs by splashing rain in the spring and early summer. While most of these spores are dispersed by early summer, the disease can spread extensively throughout the season by secondary infections caused by spores and mycelial fragments. Fruit can be infected by sooty blotch as early as 2-3 weeks after petal fall, although visible symptoms usually take 20-25 days to appear after infection. Optimum growth of the fungus occurs at a temperature of 18-21°C and a relative humidity of 99-100%. At temperatures above 26°C, or relative humidity less than 90%, virtually no growth occurs. Sooty blotch appears more frequently during those years that have cool, wet springs, late summer rains, and low temperatures in early fall.

Flyspeck and sooty blotch are very slow growing fungi. Both have the ability to go dormant during unfavourable weather conditions such as hot, dry weather, and then continue their development when favourable conditions return. Therefore, symptoms of sooty blotch and flyspeck appear most often during the harvest season, even though infection may have taken place much earlier.

CONTROL

Because the development of sooty blotch and flyspeck is highly dependent on the microclimate surrounding the fruit, practices which facilitate drying of the trees and fruit should be undertaken. Judicious pruning to maintain an open tree canopy, proper thinning of clustered fruit, and summer pruning promote better air circulation and may reduce the incidence and severity of sooty blotch and flyspeck.

Both flyspeck and sooty blotch can be controlled with most of the fungicides that are effective for apple scab. Therefore the early control of these diseases is integrated with apple scab sprays. Specific applications of fungicides for the control of flyspeck and sooty blotch in Ontario are rarely needed and are not recommended on a routine basis.

If fungicide use patterns change in the future (such as fewer or no fungicide applications, longer "days to harvest" spray intervals, and the registration of newer fungicides that may be less effective for flyspeck and sooty blotch) these diseases may, however, become more prevalent.

Where flyspeck and sooty blotch are of concern, fungicide applications should begin when weather conditions become favourable for their development, typically in August and September. Since they are such slow growing fungi, fungicide protection must be maintained close to harvest (keeping the "days to harvest" spray intervals in mind).

For a more detailed description of control recommendations, contact your local pest management advisor or horticultural crops advisor. Fungicide recommendations are also in the OMAF publication *Integrated Pest Management for Apple Orchards in Ontario*, and in OMAF Publication 360, *Fruit Production Recommendations*.

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